

Addendum 08

Smoky Canyon Mine Remedial Investigation/Feasibility Study Sampling and Analysis Plan

July 2016

Additional Small Mammal Sampling

Prepared for:



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TABLE OF CONTENTS

	<u>Page</u>
TABLE OF CONTENTS	i
LIST OF TABLES	ii
LIST OF FIGURES	ii
LIST OF ATTACHMENTS	ii
1.0 INTRODUCTION	1
1.1 Overview.....	1
1.2 Sampling Objective	1
1.3 Background Information	2
2.0 SMALL MAMMAL SAMPLING PLAN	4
2.1 Sampling Locations.....	4
2.2 Sampling Procedures.....	5
2.3 Tissue Analyses.....	5
2.4 Sample Designation.....	6
2.5 Sample Handling.....	7
3.0 REFERENCES	8

LIST OF TABLES

<u>Table</u>	<u>Title</u>
1	2016 Additional Small Mammal RI Sampling Locations
2	Parameters for Analyses of Small Mammal Tissue Samples

LIST OF FIGURES

<u>Figure</u>	<u>Title</u>
1	2016 Additional Small Mammal RI Sampling Locations

LIST OF ATTACHMENTS

<u>Attachment</u>	<u>Title</u>
1	J.R. Simplot Company Smoky Canyon Mine Standard Operating Procedure No. 26 (JRS SOP No. 26), Small Mammal Sampling
2	J.R. Simplot Company Smoky Canyon Mine Standard Operating Procedure No. 2 (JRS SOP No. 2), Sample Custody, Packaging, and Shipment

1.0 INTRODUCTION

The J.R. Simplot Company (Simplot) owns and operates the Smoky Canyon phosphate mine (the Site) in southeastern Idaho. The Site is the subject of an Administrative Settlement Agreement and Order on Consent/Consent Order (Settlement Agreement/CO) for Remedial Investigation and Feasibility Study (RI/FS) entered into by Simplot, the U.S. Department of Agriculture Forest Service (USFS), the U.S. Environmental Protection Agency (USEPA), and the Idaho Department of Environmental Quality (IDEQ) (collectively agencies) (USFS, USEPA, and IDEQ 2009). Field data collection for the RI related to small mammal tissue sampling was conducted in July 2010 in accordance with the Final RI/FS Sampling and Analysis Plan (RI/FS SAP) (Formation 2010). The Final RI Report was submitted to the agencies in September 2014 (Formation 2014a).

A Site-Specific Ecological Risk Assessment (SSERA) was completed in December 2015 (Formation 2015) to evaluate potential risks to ecological receptors at the Site. Elevated copper concentrations were detected in several small mammal tissue samples and resulted in exposure estimates that exceeded toxicity reference values (TRVs) for two receptors. Hazard quotients (HQs) for those receptors were greater than 10 in several areas. The SSERA concluded that, although Site-wide risks cannot be ruled out, there is considerable uncertainty in the results due to the high copper concentrations in some of the small mammal tissue results in relation to copper concentrations measured in surface soils. Given that there is no known source of elevated copper in the soils, along with the high concentrations of copper in several random samples, the SSERA recommended additional sampling of small mammal tissues in the areas where the high copper results were observed.

This RI/FS SAP Addendum 08 provides the objectives, background information, and the small mammal sampling plan for collection of these additional samples.

1.1 Overview

Small mammal sampling is planned for summer 2016 on selected overburden disposal areas (ODAs) at the Smoky Canyon Mine and in northern Sage Valley. The small mammal samples will be collected once during the summer season, preferably in mid-July for consistency with sample collection under the RI. Actual sampling dates will depend on the schedule for Agency approval of this plan. Sample collection is planned at a total of 11 locations as described below and shown on Figure 1.

1.2 Sampling Objective

The objective of small mammal sampling on the ODAs and in northern Sage Valley is to confirm the presence/absence of high copper concentrations in small mammal tissue in the areas where the unexpectedly high copper concentrations were observed in the original RI samples. The mammals will be trapped at about the same time of year as during the RI (mid-July). Results from the small mammal sampling will be compared to data collected previously for the RI in

order to determine whether or not the original RI data are accurate. Concentrations of the other RI chemicals of potential concern (COPCs) will also be measured by the laboratory as part of this sampling event and these data will be compared to the original RI data.

1.3 Background Information

During the SI in 2004 (NewFields 2005), small mammals were trapped at 17 locations on three separate ODAs (Panel A, Pole Canyon, and Panel D), undisturbed/native areas adjacent to the ODAs, and overburden seep areas at Panels D and E. A total of 49 mammals were submitted for tissue analyses; samples were analyzed for the seven COPCs (cadmium, chromium, copper, nickel, selenium, vanadium, and zinc) that were the focus of that investigation. Copper concentrations in small mammal tissue from the ODA areas ranged from 2.5 to 3.4 milligrams per kilogram (mg/kg). Concentrations were similar in tissue from native areas adjacent to the ODAs (2.4 to 3.1 mg/kg) and in overburden seep areas (2.3 to 3.3 mg/kg). Copper concentrations in surface soil samples collected from the ODAs ranged from 19 to 140 mg/kg, whereas copper concentrations in surface soil in northern Sage Valley were relatively lower and ranged from 14 to 31 mg/kg. Small mammal tissue copper concentrations measured during the SI were not elevated relative to concentrations in soil.

During the RI in 2010 (Formation 2014a), small mammals were trapped at 42 locations on four separate ODAs (Panel A, Pole Canyon, Panel D, and Panel E), in northern Sage Valley, and in overburden seep areas at Panels D and E. Small mammals were also trapped at 7 riparian locations. A total of 75 mammals were submitted for tissue analyses; samples were analyzed for all 22 RI COPCs. Copper concentrations in small mammal tissue from the ODA areas ranged from 14.5 to 3,900 mg/kg, with the highest concentrations in deer mouse and montane vole samples collected from Panel D South (location DPL-33) and the Pole Canyon ODA (location PCO-14). Concentrations were relatively lower in tissue samples from northern Sage Valley (180 to 565 mg/kg) and from overburden seep areas (66 to 565 mg/kg). Copper concentrations in surface soil samples collected from the ODAs ranged from 11.4 to 120 mg/kg, whereas copper concentrations in surface soil in northern Sage Valley were relatively lower and ranged from 19 to 35.2 mg/kg. Small mammal tissue copper concentrations measured during the RI were elevated relative to concentrations in soil at a number of locations, although no clear spatial distribution pattern was evident and the elevated copper concentrations did not appear to be related to reclamation type.

Although selenium is the primary ecological chemical of concern (ECOC) driving risk estimates and the potential need for risk management decisions at the Site, other ECOCs were identified as a result of Tier 1/Tier 2 analysis including cadmium, copper, lead, vanadium, and zinc for both upland and riparian receptors. Elevated copper concentrations detected in several small mammal tissue samples resulted in exposure estimates that exceeded the TRVs for both the coyote and northern harrier receptors. The concentrations observed were elevated above copper concentrations expected at the Site and showed no clear spatial relationship or relationship with copper in surface soils on reclaimed areas at the Site. Site-wide risk to both

the coyote and northern harrier cannot be ruled out. However, due to the unexpectedly high copper concentrations in several small mammal tissue samples in relation to copper measured in surface soils on the reclaimed areas, there is considerable uncertainty in that conclusion and further study is recommended prior to making risk management decisions related to copper exposure for carnivorous receptors. Additional sampling of small mammal tissues in the areas where the high copper results were observed is needed.

Since the small mammal tissue samples were collected for the RI in 2010, a Non-Time-Critical Removal Action (NTCRA) has been implemented to reduce or eliminate infiltration into the Pole Canyon ODA due to direct precipitation and address the risks associated with selenium concentrations in vegetation and soil on the surface of the ODA (USFS, IDEQ, and Tribes 2013). Construction of the Dinwoody/Chert cover system and associated storm water controls was completed in 2015. Original SI and RI sampling locations on the Pole Canyon ODA no longer exist because of this Dinwoody/Chert cover system. However, additional small mammal tissue sampling will be conducted at 2 locations on the reclaimed Pole Canyon ODA.

2.0 SMALL MAMMAL SAMPLING PLAN

Additional small mammal samples will be collected to support the SSERA in accordance with this sampling plan.

2.1 Sampling Locations

Small mammal samples will be collected from a total of 11 locations previously sampled for the RI in July 2010, as shown on Figure 1. As described above, high concentrations of copper were detected in small mammal tissue samples collected from each of these locations. Specific sampling locations are described below.

ODA Source Areas – Overburden materials excavated from mine pits were either deposited on external ODAs or used to backfill previously mined pits. The vast majority of overburden disposed was a run-of-mine mixture with varying proportions of waste shale and chert. The ODAs are considered source areas with the potential to release COPCs to the surrounding environment. Each of the ODAs has a distinct disposal setting and final reclamation condition (i.e. topsoil, no chert; topsoil, Dinwoody, chert; topsoil over chert; or no topsoil, no chert). In order to assess terrestrial biota uptake of COPCs, and to confirm or disprove the copper concentrations in samples collected for the RI, small mammal samples will be collected at 7 of the previous RI locations on the overburden areas as follows:

- Panel A Area 1 at APL-27;
- Panel D (North) at DPL-18 and DPL-21;
- Panel D (South) at DPL-32 and DPL-33;
- Panel E Area 1 at EPL-11; and
- Panel E Area 2 at EPL-25.

Northern Sage Valley – A significant portion of Pole Canyon Creek water that formerly flowed from the Pole Canyon ODA was diverted for irrigation use within Sage Valley. Due to the application of Pole Canyon Creek water to soils in Sage Valley, COPCs may have been transported across irrigated lands. In order to assess terrestrial biota uptake of COPCs, and to confirm or disprove the copper concentrations in samples collected for the RI, small mammal samples will be collected at 2 of the previous RI locations in northern Sage Valley as follows:

- Northern Sage Valley at SV-25 and SV-27.

Pole Canyon ODA – As discussed above, a Dinwoody/Chert cover system was implemented in 2015 as part of a NTCRA, to reduce or eliminate infiltration into the Pole Canyon ODA due to

direct precipitation and address the risks associated with selenium concentrations in vegetation and soil on the surface of the ODA (USFS, IDEQ, and Tribes 2013). Although the original RI surface sampling locations on the Pole Canyon ODA no longer exist, additional small mammal tissue sampling will be conducted at 2 locations on the reclaimed Pole Canyon ODA to provide a limited measurement of ECOC concentrations following reclamation. Small mammal samples will be collected on the surface of the Dinwoody/Chert cover system, as close as feasible to the locations previously sampled under the RI, as follows:

- Pole Canyon ODA at PCO-12 and PCO-14.

2.2 Sampling Procedures

Small mammal samples will be collected following the methods specified in the Final RI/FS SAP (Formation 2010) and described in detail in JRS SOP No. 26, Small Mammal Tissue Sampling, which was included with the SOPs for RI field activities as an attachment to the Final RI/FS SAP. JRS SOP No. 26 has been revised for this task to describe the methodology used for tissue sampling without the use of live traps for tissue acquisition purposes (i.e., all small mammals will be submitted for tissue analysis). A copy of the revised JRS SOP No. 26 is included herein as Attachment 1 for the convenience of the samplers.

Each small mammal sample will be collected using snap traps set throughout the same sampling quadrant that was established for the purpose of soil/overburden and vegetation sampling for the RI. The goal is to collect several animals from each location. If the site is trapped for three consecutive nights and no animals have been collected, then no sample will be collected from that sampling location. In areas where small mammal density is lower than optimal, only one sample may be collected. Efforts will be made to ensure consistent species composition among locations, but this will largely depend upon trapping success and availability; no more than 5 animals from a single site will be collected. A similar number of traps will be placed in each sampling quadrant with a minimum of 15 traps per quadrant.

Traps will be baited with peanut butter placed on the trap bait holder. Collected mammals will either be released or humanely euthanized using an inhalant. The species, weight, and sex of all collected mammals (released or sacrificed) will be recorded in the field notebook. Double surgical gloves and other protective gear specified in the RI/FS Health and Safety Plan (HASP) (Formation 2010) will be used for this process. The sample bag will be immediately labeled, double-bagged, and stored in a covered container on ice for shipment to the laboratory.

2.3 Tissue Analyses

Each collected animal will be submitted to the laboratory as a single sample for chemical analysis for the full list of RI COPCs identified in Table 2 (Table 2-10 of the RI/FS Quality Assurance Project Plan [QAPP]) (Formation 2010). Table 2 provides the updated EPA

Analytical Methods as per RI/FS SAP Addendum 06 (Formation 2014b). Samples will be analyzed for total metals and percent solids.

2.4 Sample Designation

Terrestrial biota samples collected in support of the RI/FS will be assigned a unique sample number in accordance with procedures outlined in the RI/FS QAPP (Section 2 of the RI/FS SAP; Formation 2010).

Each sample identifier will include the general sampling event, location, media type, and sample type designations, as follows:

Sampling Event - Location - Media and Type - Number

SC0716-DPL-33-MT001

The first field in the identification number identifies the general sampling location and time period. For example, samples collected in July 2016 will have the prefix "SC0716."

The second field in the identification number identifies the location of the sample. For example, DPL-33 is a sample location on Panel D South. Location identifiers established for the RI sampling in 2010 (refer to Table 2.8.1 in the RI Report; Formation 2014a) will be used for this sampling event.

The third field has three parts. The first part is a two-letter acronym that identifies the sample matrix type. The terrestrial biota matrix type for this sampling event is:

MT: small mammal tissue

The second part of the third field is comprised of a single digit describing the intended sample use. These sample use codes are:

0: primary sample

3: equipment rinsate or quality assurance/quality control (QA/QC) blank sample

The third and final part of the third field is a two-digit number unique to the specific sample. Numbers will begin with 01 and increase consecutively during the sampling event.

For example, SC0716-DPL-33-MT001, is a primary mammal tissue sample collected from location DPL-33 on Panel D South in July 2016 with the sequential number 01 (i.e., the first mammal sample collected).

Samples will be immediately labeled in the field and sample numbers recorded at the time of sampling in field notes and on field data collection forms. The trap in which the animal was collected will also be noted.

2.5 Sample Handling

Small mammal samples collected in support of the RI will be handled in accordance with JRS SOP No. 2, Sample Custody, Packaging and Shipment, which was included with the SOPs for RI field activities as an attachment to the Final RI/FS SAP (Formation 2010). A copy of JRS SOP No. 2 is included herein as Attachment 2 for the convenience of the samplers.

3.0 REFERENCES

- Formation Environmental, LLC (Formation). 2010. Final RI/FS Sampling and Analysis Plan (SAP), including Quality Assurance Project Plan (QAPP), Field Sampling Plan (FSP), and Health and Safety Plan (HASP), prepared for J.R. Simplot Company, June. Incorporates SAP Addendum 01, May 2011.
- Formation Environmental, LLC (Formation). 2014a. Final Smoky Canyon Mine Remedial Investigation/Feasibility Study Remedial Investigation Report, prepared for J.R. Simplot Company, September 2014.
- Formation Environmental, LLC (Formation). 2014b. Final Addendum 06, Smoky Canyon Mine Remedial Investigation/Feasibility Study Sampling and Analysis Plan, Updated EPA Laboratory Methods. Prepared for J.R. Simplot Company, Afton, WY and Boise, ID. November 2014.
- Formation Environmental, LLC (Formation). 2015. Final Smoky Canyon Mine Remedial Investigation/Feasibility Study Site-Specific Ecological Risk Assessment Report, prepared for J.R. Simplot Company, December 2015.
- NewFields. 2005. Final Site Investigation Report Smoky Canyon Mine, Caribou County, Idaho, prepared for J.R. Simplot Company, July 2005.
- U.S. Department of Agriculture Forest Service Region 4, U.S. Environmental Protection Agency, Region 10, and Idaho Department of Environmental Quality (USFS, USEPA, and IDEQ). 2009. Administrative Settlement Agreement and Order on Consent/Consent Order (Settlement Agreement/CO) for Performance of Remedial Investigation and Feasibility Study for Smoky canyon Phosphate Mine in Southeastern Idaho. J.R. Simplot Company Respondent. Signed August 13, 2009.
- U.S. Department of Agriculture, Forest Service Region 4, Idaho Department of Environmental Quality, Shoshone-Bannock Tribes (USFS, IDEQ, and Tribes). 2013. Administrative Settlement Agreement and Order on Consent/Consent Order for Non-Time-Critical Removal Action, Smoky Canyon Phosphate Mine. J.R. Simplot Company Respondent. Signed November 27, 2013.

TABLES

FIGURES

ATTACHMENTS